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ABSTRACT

A study examined the relationship of independent variables to scores on the National Teacher Examinations Test of Professional Knowledge (TPK) to determine the best combination of predictor variables to account for variance on the TPK. Data were elicited from 202 undergraduate students at Furman University who had already taken the TPK and were currently enrolled in the teacher education curriculum. Twenty independent variables were selected from scores on the Scholastic Aptitude Test, high school class rank, grade point average, grades from college courses, scores on the Education Entrance Exam (a basic skills examination for future teachers), and results from the Assessment of Performance in Teaching (a state-mandated classroom observation instrument used with student teachers). Results revealed that the TPK measures the ability to take verbal tests more than anything else, and that professional knowledge as measured by this test is best predicted by another NTE test. Results also revealed the following: (1) SAT verbal scores alone account for approximately 35% of the variance on the TPK; (2) grades in certain courses are significantly related to TPK performance, but all the best grade predictors, including overall cumulative grades, do not account for as much of the variance as the SAT verbal score; and (3) by adding courses that have a high relationship with performance on the TPK, only 5% more of the total variance is accounted for. (Three tables of data are included; 15 references are attached.) (KEH)

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Examining Transmitters of Literacy: Factors Related to Performance on the NTE Test of Professional Knowledge

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Running Head: Test of Professional Knowledge

Examining Transmitters of Literacy: Factors Related to Performance on the NTE Test of Professional Knowledge

The NTE Test of Professional Knowledge is one test from the NTE Core Battery of tests. The Core Battery also includes a Test of Communication Skills and a Test of General Knowledge. The Test of Professional Knowledge is a requirement for all students being certified to teach reading or anything else in South Carolina.

At Furman University and other institutions of higher education in South Carolina, continuation of approval for a teacher education program is contingent upon students in a program reaching a certain level of proficiency on the NTE Test of Professional Knowledge. The South Carolina State Board of Education had the responsibility of selecting the examination and establishing a passing score. The State Board of Education also established the minimum percentages of students within an institution who must pass the test for the teacher education program to remain in good standing.

The Test of Professional Knowledge (TPK) is celebrated by the Educational Testing Service (1984) as

a test "based on the process of teaching as it relates to the context of teaching" (p. 101). According to ETS, a question might relate to one or both; a question might require knowledge of the process or the context of teaching or both. The Educational Testing Service asserts that "the aspects of professional education probed by questions in this test are considered basic to the education of any teacher, regardless of the teacher's particular training, grade-level focus, or subject matter specialty" (ETS, 1984, p. 101).

The TPK emphasizes two major areas. One area involves the assessment of examinees' knowledge about planning, implementing instruction, and managing the classroom. Another area, the "contextual" focus, involves assessment of examinees' knowledge of how factors other than instruction influence learning and educational practice. These include (among others) legal directives, social conditions, cultural diversity, and knowledge of human development.

Significance of the Investigation

The Educational Testing Service (1989) reported in the 1989-1990 Bulletin of Information that "all NTE programs user states and/or institutions are required to perform a validity study of each test before it can

be adopted" (ETS, 1989, p. 6). The two paragraphs related to validity of the NTE tests in the latest ETS bulletin assert that "the validity of the examinations relates most directly to the content of teacher education programs" (p. 6). At this point one holds the chin upright and smiles as the wind hits the face and the carrousel plays its music and continues to turn. If one validates a Test of Professional Knowledge for teachers solely by ascertaining that it relates to teacher education programs, that is tantamount to validating a test of professional knowledge for Florida Skyway Bridge welders without ever examining a single weld. While virtually no one would deny the value of content validity, many would ask about the criterion-related validity of an NTE Test of Professional Knowledge in the same way one would ask about the bridge welders' external criterion of success.

This study is an initial attempt to gather and disseminate data related to the concurrent validity of the TPK. Concurrent validity is the extent to which test performance is related to some other performance. Since little empirical research has been done in South Carolina and other states, notwithstanding the

implications such a test has, it seems necessary to analyze the relationships that exist between this test and other variables. What does constitute adequate professional knowledge for teaching reading? What is it that a simple test could evaluate that would supposedly separate the minimally competent didactic sheep from the pedagogically lacking pedantic goats? It seems profound to ask, "What must a teacher of reading know?" The Educational Testing Service and state departments of education apparently do not allow the same gnarly, intricate ruminations to stifle progress the way American Reading Forum members do.

Owen (1989) stated that the easiest way to improve on the TPK would be to get rid of it. Gifford (1986) disagreed and called this a "simplistic and unrealistic response to a complicated issue" (p. 15). Gifford called for development of better tests as the appropriate public policy priority.

This investigation is an initial peek at empirical data that might assist in our understanding of the validity of this test for our institution.

Review of Literature

Eisenberg and Rudner (1988) reported that the number of states that now require at least one of the

two most common forms of teacher testing, admissions tests and certification tests, has grown from 10 states in 1980 to 46 in 1988. The majority of these states use certification tests, 36 in all. Furthermore, 26 of the 36 states that use certification tests use existing tests. Twenty-three of the states that use certification tests attempt to evaluate professional teaching skills. Murray (1986) reported that 17 states used the NTE Test of Professional Knowledge. Murray (1986) further stated that:

> Unlike tests used for admissions to teacher training programs, tests used for certification must be validated in terms of job relevance, and cutoff scores must be based on what is minimally required to perform as a beginning teacher in a state. (p. 18)

Murray (1986) referred to the controversy surrounding the validation of certification tests. Two content domains that have been of interest for certification tests are the curricula of teacher training institutions and the knowledge needed to perform the job tasks required of teachers. Murray (1986) stated that "Initial controversy over which of these two content domains is most appropriate has been

resolved in favor of job relevance for certification" (p. 25). If such was the case initially, the last few years have seen little to no emphasis on criterion-related validity in certification testing. Could this be because of the very poor predictive validity of these tests? Empirical data currently available do not adequately establish correlation of test performance with job-relevant work behaviors.

Goodison (1985) presented the same circular argument for using paper-and-pencil tests that one often hears as justification for such instruments. She admitted that the tests have their limitations and do not predict success in the classroom, "but to assure the public that the teachers in our classrooms possess at a minimum the necessary basic skills, then the paper-and-pencil tests will do the job for us they were meant to do" (p. 7). At this point one staggers to the edge of the carrousel with glazed eyes attempting to regain equilibrium. How does one "assure the public that the teachers in our classrooms possess at a minimum the necessary basic skills" when there is little to no empirical verification of such basic teaching skills?

Gifford (1986) stated unequivocally that there is little agreement among practitioners and researchers as to what beginning teachers need to know. "The judgements of ETS panelists about test item validity may therefore have been situational, subjective, and idiosyncratic" (p. 14). It is true that ETS requires each state that chooses the NTE to conduct its own validity study. Gifford (1986) reported that this has not increased confidence in the NTE's validity because ETS itself has subsequently conducted most of these state studies.

Gifford (1986) argued that the content of the NTE Core Battery tests appears to be more closely related to the curricula of teacher training programs than to the competency of effective beginning teachers. Gifford (1986) asked in a state of bewilderment why, in light of the manifest need to reform teacher education programs, we can assume that the content of teacher training curricula reflects the proficiency levels needed by capable entry level teachers? Owen (1985) in calling for abandonment of the TPK makes a convincing argument that the quality of teaching may be reduced by the use of the test since its relationship to teacher

training curricula validates the mediocrity of such programs.

Andrews (1984) questioned the validation of tests by the expert opinion approach. He raised concerns that consensus may not be sufficient to ensure that tests are really valid measures of skills essential to teaching.

Past research (Ayers, 1988) indicated that relationships between scores from the NTE and rating devices and observation instruments for teaching were low and not significant. Ayers (1989) subsequently conducted research which examined the relationships between students' scores on the Test of Professional Knowledge and principal ratings on teacher effectiveness. Teacher effectiveness was divided into 13 different variables. Few, if any, would disagree with the characteristics of effective teachers included in the instrument such as: provides opportunities for students to participate, evaluates student progress and provides feedback, effectively manages student behavior, presents information clearly, maintains a supportive environment, etc. All the correlations in Ayers's (1989) data were low and only one variable approached significance, "classroom participation."

The TPK score accounted for 11 percent of the variance. Twelve of the thirteen correlations between TPK and Teacher Effectiveness were not significant.

Ayers (1989) also conducted another study using a different instrument that examined the relationships between principal rating of teacher effectiveness and TPK scores. With such characteristics as enthusiasm, time management, praise, questioning, etc., on the instrument, Ayers (1989) found only one of the fourteen characteristics significantly related to TPK performance. "Involvement" again involved student participation and was significantly related to the TPK. Ayers (1989) concluded that the NTE provided little information that would be useful in predicting the success of an individual entering the classroom.

Ashburn (1987) reviewed the research and concluded that scores on NTE tests have no consistent relationship to pupils' gains in achievement or observers' assessments of teacher performance. Ashburn (1987) concluded that the standardized tests for measuring teacher competence, including the TPK, "do not provide us with reliable distinctions among those who are more competent and less competent as teachers" (p. 13). Ayers (1989) stated emphatically that the NTE

should not become, as it has in several states, the sole criterion for licensure as a teacher in the classroom.

Ashburn (1987) stated that most of what is known about effective teaching from research has been learned in the past decade, and has not been available to teacher education programs. She then quoted Rosenshine (1986) who pointed out that this new research on effective teaching is particularly useful for teaching a body of well-defined skills such as mathematical procedures, but has less relevance for teaching concepts that are fuzzier and more entangled such as reading comprehension or historical trends.

Because of such obstacles to agreement as to what constitutes essential knowledge in a curriculum for developing competent beginning teachers, Egbert (1985) has said that teacher evaluation is "just whatever the state or faculty defines it as being" (p. 17). While there may be more agreement than that, there is no denying the fact that little empirical evidence is available to help validate a test that ostensibly has something to do with knowledge of effective teaching behaviors. It is possible that a shortage of such data is a result of the lack of a veritably significant

relationship between the test measuring "professional knowledge" and the professional knowledge genuinely needed to do the job.

Method

The current study attempts to determine the relationship of 20 independent variables to scores on the NTE Test of Professional Knowledge. The study also attempts to find the best combination of predictor variables to account for the variance on the TPK.

Subjects

The subjects for this study were 202 undergraduate students in the teacher education curriculum of Furman University. The subjects had taken the TPK from Spring 1988 to Spring 1990. The Education Department offers a major in Education with concentrations in elementary education, early childhood education, and special education. Students preparing for secondary school certification must major in the subject they plan to teach. They then take four courses in the Education Department that lead to certification.

Operational Definitions

The predictive independent variables for the study will include verbal (SATV), quantitative (SATM), and total (SATT) scores on the Scholastic Aptitude Test.

High school class rank (RANK) is defined in terms of the percentage of students that each examinee outperformed in the respective graduating high school class. The predicted grade-point-average (PGPA) is the grade-point-average Furman University predicted a student would achieve after one year at the institution. In order to predict this average, the university takes into account a student's sex, type of high school (public or private), SAT scores, class size, and high school rank. These predicted-grade-averages are computed by means of a multiple regression formula.

The Education Entrance Exam (EEE) is a basic skills examination developed for entry into teacher education in South Carolina. The EEE requires future teachers in South Carolina to demonstrate proficiency in basic reading (EEER), mathematics (EEEM), and writing (EEEW). The study also combined all three subtests for a total score (EEET).

The Assessment of Performance in Teaching (APT) is a state-mandated classroom observation instrument used with student teachers in South Carolina. All student teachers in South Carolina must be observed in the classroom and an assessment must be made of their

performance using this instrument. Student teachers then supposedly receive assistance, training, and counseling to help overcome deficiencies.

Grades from several different courses were analyzed to determine the relationship with scores on the TPK. For statistical analysis, all grades from courses and the cumulative grade-point-average in education was assigned a number from 0 to 12 based on the following interval-ratio scale: F = 0, D- = 1, D = 2, D+ = 3, C- = 4, C = 5, C+ = 6, B- = 7, B = 8, B+ = 9, A- = 10, A = 11, and A+ = 12. Education 20 (ED20) is a course titled Human Development. It focuses on physical, cognitive, social, and emotional aspects of development from conception through old age. Education 21 (ED21) is a course called Field Experience and Nature of Exceptional Children. It is a study of the characteristics of exceptional children and youth and the history of special education services. Instructional experience with the exceptional student is incorporated. Education 31 (ED31) is Teaching the Handicapped in the Regular Classroom. This course focuses on strategies for appropriate education of handicapped students in the regular class. Psychology 21 (PSY21) is a General Psychology course that is a

prerequisite to courses in education. Education 60 (ED60) is a general methods course for all students entering teaching. Furman has an elementary and a secondary generic methods course. Education 65 (ED65) is a course focusing on and titled Historical, Philosophical, and Sociological Bases of Education. Education 70 (ED70) is student teaching.

The study used a cumulative grade-point-average for all courses having an ED prefix (EDGPA) and a Furman overall grade-point-average (FUGPA). South Carolina also requires all students to obtain a passing score on the respective NTE Specialty Area Tests (NTE) before being certified to teach. The scores from these specialty area tests were also used in the current study.

Questions Raised

The study attempted to answer some basic questions about performance on the TPK at Furman University. What variables are significantly related to performance on the TPK? What combination of variables most efficiently account for the variance on this test? Do other standardized test scores predict TPK performance better than course grades? Do course grades add to our

prediction of TPK scores when combined with other test scores? If so, which grades add to the prediction?

Results

Insert Table 1 about here

Table 1 give the number of cases, means, and standard deviations for all variables. The subjects of the study averaged well over 500 points on the verbal and quantitative portions of the SAT, outperformed 89% of their peers in high school and predicted a high "C" average at Furman. They earned average grades of "B" and higher on all Education courses and their overall Furman grade-point-average. While the passing score on the TPK in South Carolina is 642, the Furman average is well above that cut-off score.

Insert Table 2 about here

Table 2 gives the correlations between 20 independent variables and the NTE Test of Professional Knowledge. As expected, scores on the NTE Specialty Area Exams gave the highest correlation with the TPK, another NTE test. The next highest correlation was the

SAT verbal score. The Furman overall grade-point-average yielded a high correlation, as did the reading subtest of the Education Entrance Exam. Of the highest correlations, note the inclusion of 3 different courses, ED 20, PSY 21, and ED 31, and the cumulative Education grade-point-average. The correlation between ED 31 and the TPK is noteworthy because only 45 of the 193 subjects who took the TPK also took this course. It is not required for all students. The grades in ED 31 accounted for 32.25% of the variance on the TPK.

The five lowest correlations are interesting. One would hypothesize that student teachers' scores on an observation instrument (APT) used to observe and rate performance in the classroom might be related to professional knowledge. The APT came in dead last with no relationship to TPK performance. Student teaching (ED 70) yielded next to the lowest correlation. The lack of variability on these two independent variables might be responsible for the lower correlations. Grades in ED 65, the course focusing on historical, philosophical, and sociological bases of education, showed little correlation with TPK scores. The course accounted for only two percent of the variance on the TPK. Grades in ED 60, the general methods course,

accounted for a mere seven percent of the variance. ED 21, a course on the nature of exceptional children, had no significant relationship to scores on the TPK.

Best Multiple Predictors

Insert Table 3 about here

Table 3 gives the best combinations of independent variables discussed in this section with the corresponding multiple correlation coefficients.

We examined the data with forward stepwise regression. The independent predictive variables of NTE Specialty Area Tests (NTE), SAT Verbal, ED 31, and ED 20 yielded a multiple correlation coefficient of .724 which accounted for 52% of the variance on the TPK. We dropped ED 20 from the independent predictive variables and obtained a multiple correlation coefficient of .711, accounting for 50% of the variance on the TPK, using NTE, SATV, and ED 31 as predictors.

We dropped the NTE Specialty Area Tests as a predictor variable to analyze the strength of a multiple correlation coefficient using the best combination of other standardized test scores. This included: SATV, SATM, SATT, EEER, EEEM, EEEW, and EEET.

The results show that SATV alone accounts for 33% of the variance. None of the other tests combine with SATV to significantly affect the prediction.

We analyzed the predictive power of all the variables involving grades. The strength of these were compared to the strength of the standardized test variables. The predictive independent variables FUGPA, ED31, PGPA, and ED20 computed a multiple correlation coefficient of .528 accounting for 27.9% of the variance on the TPK. These data reveal that standardized test scores predict performance on the TPK better than grades in courses and various grade-point-averages. SATV predicts performance on the TPK better than any combination of course grades including the subjects' overall predicted and earned grade-point-average.

We analyzed the effect on the multiple correlation coefficient of adding course grades to SATV. ED 31 combined with SATV yielded a multiple coefficient of .608 or 37% of the variance on the TPK. The addition of ED 20 resulted in a multiple coefficient of .63 and 40% of the variance. These two courses concerning Human Development and Teaching the Handicapped in the

Regular Classroom do assist marginally in explaining variance on the TPK.

Discussion

The data seem to reveal that the TPK measures the ability to take verbal tests more than anything else. The data show that professional knowledge as measured by this test is best predicted by another NTE test. In the absence of such a test, the SAT verbal score alone will account for approximately 35% of the variance on the TPK. Grades in certain courses are significantly related to TPK performance, but all the best grade predictors, including overall cumulative grades, do not account for as much of the variance as the SAT verbal score. By adding courses that have a high relationship with performance on the TPK, we account for only five more percent of the total variance on the TPK.

Since the TPK ostensibly achieved content validity through verification by panels of teacher educators and teaching practitioners, one wonders why stronger relationships aren't seen with grades from education courses at Furman. One possibility is that the courses don't have the content of the test. It may also be true that the courses prepare excellent teachers, but the test may not actually measure the skills and

knowledge needed by a competent teacher with a strong liberal arts background. It is interesting that ED 65 accounted for only two percent of the variance on the TPK, yet yielded a very high correlation with Furman's overall grade-point-average, r (187) = .52, $p < .001$. Grades in ED 60, the generic methods course, correlate even higher with Furman's overall grade-point-average, r (145) = .56, $p < .001$, yet Ed 60 had a much smaller relationship to the TPK, r (145) = .27, $p < .001$. This suggests that evaluation in these courses is similar to evaluation in other courses at Furman. If students did not master the content, the grades would reflect that. The low correlation coefficients between the grades in Education courses and the TPK causes one to question the content validity of the TPK.

Past research (Lanier and Little, 1986) has concluded that teachers' scores on the NTE tests have no consistent relationship to students' gains in achievement or observers' assessment of teacher effectiveness. But little to no concurrent validity studies have examined the empirical relationship between teacher education curricula and the NTE tests. This study suggests that a closer look is warranted.

McCarthy (1987) reported that the teacher testing movement fits the current conservative social-political-economic milieu in the country. Increased attention to the basics, intensified discipline in schools, and a national demand for rigor provide extraordinary support for teacher testing. The assumption of the American public is that teachers who pass the NTE Test of Professional Knowledge will be better and more effective teachers than those who do not pass. Since one must pass such a test to teach in South Carolina and surrounding states, that assumption will prevail for the immediate future, our doubts notwithstanding.

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Table 1

Means and Standard Deviations for all Variables

Variable	N	Mean	Std Dev	Min	Max
SATV	192	512.34	75.61	330	720
SATM	192	548.07	76.98	380	730
SATT	192	1060.42	126.86	770	1360
RANK	171	89.38	12.60	30.00	99.84
PGPA	167	2.74	.37	1.90	3.70
EEER	202	285.35	18.26	250	320
EEEM	202	270.91	19.47	230	320
EEEW	202	3.64	.41	3.0	4.0
EEET	202	558.79	33.01	453.0	644.0
APT	201	48.70	1.57	42.3	51.0
ED20	191	7.97	2.07	1	11
ED21	57	9.44	1.59	5	12
ED31	45	10.04	1.45	5	11
PSY21	167	5.53	2.56	1	11
ED60	147	8.76	1.37	4	11
ED65	189	7.84	.13	4	12
ED70	180	9.95	1.78	2	12
EDGPA	190	8.81	1.15	5.00	11.00

table continues

Variable	N	Mean	Std Dev	Min	Max
FUGPA	200	3.01	.39	2.03	4.00
NTE	188	679.94	62.31	470	830
TPK	193	665.81	7.56	640	681

Table 2

Correlation Coefficients of Independent Variables with TPK

Independent Variable	N	r	p	r^2
SATV	183	.594	p < .001	.353
SATM	183	.246	p < .001	.061
SATT	183	.508	p < .001	.258
RANK	163	.228	p < .003	.052
PGPA	163	.380	p < .001	.144
EEER	193	.416	p < .001	.173
EEEM	193	.260	p < .001	.068
EEEW	193	.244	p < .001	.059
EEET	193	.392	P < .001	.154
APT	192	-.018	p = .800	.000
ED20	184	.409	p < .001	.167
ED21	57	.227	p = .090	.052
ED31	44	.568	p < .001	.323
PSY21	158	.422	p < .001	.178
ED60	140	.272	p < .001	.074
ED65	180	.145	p = .052	.021
ED70	175	-.031	p = .684	.001

table continues

Variable	N	r	p	r^2
EDGPA	183	.339	$p < .001$	.115
FUGPA	192	.439	$p < .001$	.193
NTE	184	.609	$p < .001$	.371

Table 3

Best Combinations of Independent Variables

Variable		multiple r	r^2
NTE			
SATV		.72421	.52448
ED31			
ED20			
NTE			
SATV		.71157	.50634
ED31			
SATV	(tests)	.59430	.35300
FUGPA	(grades)		
ED31		.52857	.27938
PGPA			
ED20			

table continues

Variable	multiple r	r^2
SATV	.60848	.37000
ED31		
SATV		
ED31	.63364	.40000
ED20		